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REMARKS

Claims 11 – 16, and 21 - 25 are pending in the present Application. Claims 1 – 10 and 17 - 20 have been canceled, Claims 26 - 29 have been added, leaving Claims 11 – 16 and 21 - 29 for consideration upon entry of the present Amendment.

Claims 26 and 27 have been added to further claim the present invention. Support for these claims can at least be found in Paragraph [0027]

Claim 28 has been added to further claim the present invention. Support for this new claim can at least be found in the claims as originally filed.

Claim 29 has been added to further claim the present invention. Support for this new claim can at least be found in the claims as originally filed, as well as in Paragraph [0025].

The specification has been amended to correct a typographical error.

No new matter has been introduced by these amendments or new claims.

Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. §103(a)

Claims 11 - 16 and 21 - 25 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over U.S. Patent No. 6,036,827 to Andrews et al. in view of Japanese Publication No. JP401066537A to Ono et al. Applicants respectfully traverse this rejection.

The Examiner contends that Andrews et al. teach a process for operating an electrochemical system comprising:

introducing water to an electrolysis cell;

producing hydrogen;

separating hydrogen from water in the hydrogen/water separator;

introducing environmental gas disposed around the electrochemical system components to the hydrogen gas detector; and

determining the hydrogen concentration in the environmental gas.

(Final Office Action, pages 2 – 3) It is admitted, however, that Andrews et al. fail to teach "calibrating a hydrogen gas detector by passing a hydrogen-free gas through a first conduit to the hydrogen detector, wherein the wherein the hydrogen gas detector generates a first signal;

flowing a known quantity of hydrogen gas from a hydrogen/water separator through a second conduit to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture; and calibrating the hydrogen gas detector based upon the first and second signals. *Id.*

It is further stated, however, that

> the calibration of a measuring device, such as a detector, is well known in the art for providing an accurate reading by the device. It would be obvious to one of ordinary skill in the art... to calibrate a detector by using know standards of samples...

If the Examiner is taking Official Notice that it is known in the art to operate an electrochemical system in the method claimed, including the calibration of a hydrogen detector as set forth in the claims, Applicants respectfully disagree and request that the Examiner provide documentary evidence of such a process. Although a device may be calibrated during part of the production of that device, such calibration does not teach or suggest the method of operating an electrochemical system as claimed herein. Furthermore, such production calibration fails to address the problems associated with manual recalibration as is discussed in the Brief Description of the Related Art in the present application.

> Recalibration of the hydrogen gas detectors is periodically required to ensure accurate readings and safe operating conditions. Presently, calibration is performed manually. That is, an operator physically sprays control mixtures of air and hydrogen gases directly onto the gas detectors. The operator then manually calibrates the detector to ensure accurate readings during operation of the system. However, manual calibration requires an operator to physically make the necessary detector adjustments.

(Paragraph [0002]) The claimed process is unique. There is no teaching or suggestion in Andrews et al., even with the knowledge that calibration of the hydrogen gas detector improves its accuracy, of the method claimed in the present application.

Due to the lack of teaching of Andrews et al., Ono et al. is relied upon to allegedly teach a method of calibrating a hydrogen gas detector. It is alleged that Ono et al. teach

> passing the hydrogen-containing gas to a hydrogen detector, wherein the hydrogen gas detector generates a first signal to determine a correlationship between the concentration of hydrogen and an output signal of the hydrogen gas detector. This is followed by flowing an unknown concentration of hydrogen gas with a non-hydrogen gas (equivalent to the hydrogen free gas mixed with hydrogen in the

> instant application) to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture. The concentration of hydrogen is calculated by a calibration curve formula with an output signal of the hydrogen gas detector....

(Final Office Action, pages 3 – 4) It is not understood how "flowing an unknown concentration of hydrogen gas with a non-hydrogen gas is equivalent to the hydrogen free gas mixed with hydrogen in the instant application". However, in the present application, the "hydrogen mixed with the hydrogen-free gas" has a known hydrogen concentration. As is stated in the Final Office Action, Ono et al. are flowing "an unknown concentration of hydrogen gas with a non-hydrogen gas". Hence, Ono et al., this mixture is *not* equivalent to "the hydrogen free gas mixed with hydrogen in the instant application". Ono et al.'s mixture does not have a known quantity of hydrogen. Ono et al. do not teach the process of the present claims or even teach the calibration portion of the process of the present claims.

The present application addresses the issue of calibrating a hydrogen detector in an electrochemical cell system. As discussed in the Brief Description of the Related Art, the sensitivity and accuracy of hydrogen gas detectors drift over time. The present system and method allow the hydrogen detector to be calibrated to adjust for the drift. The hydrogen detector can actually be recalibrated and periodically calibrated. (see Claims 25 – 27) The taught and claimed method comprises: passing a hydrogen-free gas to the hydrogen detector, wherein the hydrogen gas detector generates a first signal; flowing a known quantity of hydrogen gas from a hydrogen/water separator to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture; and calibrating the hydrogen gas detector based upon the first and second signals. This claim, therefore, requires the use of both a hydrogen-free gas and a known quantity hydrogen gas.

As admitted in the Final Office Action, Andrews et al. do not discuss calibration of the hydrogen detector as presently claimed. (Final Office Action, page 3). They also do not teach a system arranged such that the detector can be contacted with a known quantity of hydrogen gas to generate one signal and with a hydrogen-free gas to generate another signal, as claimed in the present application. It is also admitted that Ono et al. "do[] not teach passing hydrogen-free gas through... to the hydrogen gas detector or flowing a know quantity of hydrogen gas from a

hydrogen/water separator... to the hydrogen gas detector...". (Final Office Action, page 4) Yet it is still alleged that

> one of ordinary skill in the art would recognize from the teachings of Andrews et al.... that a common source of a known quantity of hydrogen gas would be most available from the hydrogen generating system in order to calibrate the system as a hydrogen source as taught in Ono.

(*Id.*)

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

There is no teaching or suggestion to redesign Andrews et al. and/or Ono et al. to attain the present claims, and no expectation of success. The present claims teach a process of operating an electrochemcial system that includes calibrating a hydrogen detector. The elements of the present claims are not taught in either reference, or even a combination thereof. If Andrews et al. and Ono et al. fail to teach a method of operating an electrochemical cell comprising passing a hydrogen-free gas to the hydrogen detector, wherein the hydrogen gas detector generates a first signal, flowing a known quantity of hydrogen gas to the hydrogen gas detector, wherein the hydrogen gas detector generates a second signal corresponding to a percentage of the hydrogen gas in the mixture, and calibrating the hydrogen gas detector based upon the first and second signals, then the combination of these references must also fail to teach this.

Regarding the dependent claims, it is further noted that neither reference teach the details of the dependent claims. For example, the production of electricity with a system comprising a process that uses the present calibration process is not taught or obvious. It is also not obvious to

have the gases at about ambient pressure. No prima facie case of obviousness has been established.

In response to the above remarks, the Examiner contends that, with respect to Ono et al., the Examiner does not dispute that Ono et al. do "not teach the use of both a hydrogen free gas, a known quantity of hydrogen gas and two detector signals that correspond to each gas." (Final Office Action, page 6) The Examiner contends that the

> rejection is based upon 35 U.S.C. 103 and states that it would be obvious to calibrate the hydrogen gas detector taught by Andrews et al.... and using the method of comparing relative output signals based on the amount of a known concentration of hydrogen, as taught by Ono et al...., in order to accurately detect the hydrogen concentration in the environmental gas... and that it would be obvious to use various known concentrations of hydrogen in order to develop a calibration curve for the detector including a hydrogen free gas. This will provide a low end signal value for calibration.

(Final Office Action, Page 7) With regard to there being no motivation to combine the references, the Examiner contends that:

> this is not persuasive, as the skilled artesian would understand that the calibration of detectors is proper to ensure that the measured readings are accurate. This is a standard practice in the art of measuring and is noted in Ono for giving a correlation between the hydrogen concentration and the signal of a detector.

Although calibration may have been done in the past, e.g., calibration during production and/or manual calibration, there is no teaching of operating an electrochemical system as claimed in the present application. Wherever the references fail to teach elements of the present claims it is alleged that such elements would be obvious without evidence supporting the position, without motivation to redesign the system of Andrews et al. and/or Ono et al., and without an expectation of success. No *prima facie* case of obviousness has been established. Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the objection(s) and rejection(s) and allowance of the case are respectfully requested.

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If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 06-1130.

Respectfully submitted,

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